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STRATIGRAPHY, SEDIMENTARY SIGNATURES, AND PROCESSES ASSOCIATED WITH THE CHICXULUB ASTEROID IMPACT IN THE GORGONILLA ISLAND K/PG SECTION

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The recent discovery of a Cretaceous/Paleogene marine bathyal section on Gorgonilla Island (Gorgona National Natural Park, Pacific of Colombia) has revealed the presence of a virtually unaltered spherule-rich bed, which hosts the most pristine K/Pg boundary spherules known to date. Solid evidence, which includes stratigraphy, sedimentology, mineralogy, chemistry, micropaleontology, palynology, and $^{40}Ar/^{39}Ar$ geochronology, confirms that the spherule-rich bed represents Chicxulub impact ejecta deposits associated with the Cretaceous-Paleogene boundary (66 Ma).

The spherule-rich Gorgonilla bed is a continuous 2 cm normally-graded unit in which up to 90% of the spherules are true glass. In this pristine bed, the absence of siliciclastic debris, bioturbation, microfossils, and the lack of evidence for abrasion or traction currents collectively indicate rapid deposition and *in situ* preservation. This is also supported by the excellent preservation of delicate details of the texture, such as the abundance of compressed and welded spherules, convex-concave contacts, and the extraordinary preservation of delicate forms (round, oval, teardrop, and dumbbell-shaped microtektites with abundant vesicles). This suggests parautochthonous deposition and indicates that Gorgonilla´s spherules were deposited directly after settling through the water column with minimal disturbance, minutes to hours after the Chicxulub impact.

Gorgonilla provides a post-impact “snapshot” of events triggered by the Chicxulub asteroid impact that includes seismic disturbances (earthquakes and aftershocks), ejecta deposits (microtektites and microkrystites), paleobiological changes associated with the K/Pg mass extinction event and the first evidence of the recovery of life.

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